

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (previously presented): A method for labeling synthesis of ketones, comprising:

- (a) providing a high pressure reaction chamber having a liquid inlet and a gas inlet in a bottom surface thereof,
- (b) providing a solution to be labeled comprising a triflate of formula $R_1\text{-OTf}$, wherein R_1 is linear or cyclic alkyl or substituted alkyl or a heteroaryl group; a boronic acid having a formula $RB(OH)_2$, wherein R is linear or cyclic alkyl or substituted alkyl, aryl or substituted aryl; and a transitional metal complex,
- (c) introducing a carbon-isotope monoxide enriched gas-mixture into the reaction chamber of the UV reactor assembly via the gas inlet,
- (d) introducing at high pressure said solution mixed with transition metal complex into the reaction chamber via the liquid inlet,
- (e) waiting for a predetermined time while the labeling synthesis occur, and
- (f) removing the labeled ketones from the reaction chamber.

Claim 2 (original): A method of claim 1, wherein the carbon-isotope monoxide enriched gas-mixture is produced by a method comprising:

- (a) providing carbon-isotope dioxide in a suitable carrier gas,
- (b) converting carbon-isotope dioxide to carbon-isotope monoxide by introducing said gas mixture in a reactor device,
- (c) trapping carbon-isotope monoxide in a carbon monoxide trapping device, wherein carbon-isotope monoxide is trapped but not said carrier gas, and
- (d) releasing said trapped carbon-isotope monoxide from said trapping device in a well defined micro-plug, whereby a volume of carbon-isotope monoxide enriched gas-mixture is achieved.

Claim 3 (original): A method of claim 1, wherein the carbon-isotope is ^{11}C , ^{13}C , or ^{14}C .

Claim 4 (original): A method of claim 1, wherein the carbon-isotope is ^{11}C .

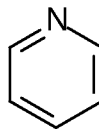
Claim 5 (original): A method of claim 1, wherein the step of introducing the solution to be labeled mixed with a transitional metal complex is performed using a pressure that is about 80 times higher than the pressure before the introduction, in order to maintain a pseudo one-phase system.

Claim 6 (original): A method of claim 1, wherein the step of waiting a predetermined time comprises adjusting the temperature of the reaction chamber to enhance the labeling synthesis.

Claim 7 (original): A method of claim 1, wherein the transitional metal complex is a palladium metal complex.

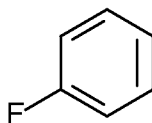
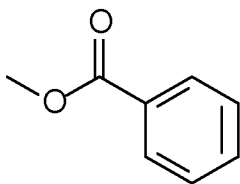
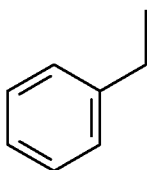
Claim 8 (cancelled)

Claim 9 (previously presented): The method of claim 1, wherein R_1 is $C_{10}H_7$ or



Claim 10 (cancelled)

Claim 11 (previously presented): A method of claim 1, wherein R is selected from phenyl,



methyl, or theinyl.

Claim 12 (original): A method of claim 1, wherein the solution to be labeled is further mixed with lithium bromide to facilitate the reaction.

Claim 13 (original): A labeled ketone synthesized according to a method of claim 1 having a formula of R_1-C^*O-R , wherein * is labeled carbon position, and R_1 and R are independently linear or cyclic alkyl or substituted alkyl, aryl or substituted aryl.

Claims 14-23 (cancelled)